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THE IDEA OF THE "UNIVERSITAS" AS A PRESENT-DAY PROBLEM*

Academic education has been a topic of discussion ever since the first universities were founded in the Middle Ages. Every generation has been critical of the generation preceding it and has given vent to its criticism. Only a few periods in the university's history, however, have shaped its further development. In these periods criticism was not confined to problems of adaptation – which are always presenting themselves, in normal times too – but was concerned with the very essence, principles and objectives of the university. At such periods the community as a whole also regarded the university's rôle in society as a matter of close concern to itself. The university went through such a period of ferment, in which a culture searches for new paths to take, new forms to adopt, in the previous century, when, inspired by Idealism, the Germans reformed their universities so as to place science and higher education at the service of Truth. Human reason, with its powers of analysis, was then regarded as capable, step by step, of penetrating ever deeper into the secrets of nature, man and society and of approaching closer to the truth. The search for Truth was the lofty calling of all science, and it was the universities' task to serve science and lead students into its sacred halls. This view resulted in a great flowering of the universities. The German example had a powerful influence on university reforms in other countries as well, and in Holland it was even the dominant influence.

The ideal waned, however. Science proved to be highly adaptable to *practical* ends and scientific research began to be organized to serve useful purposes in society. In the first world war this took place on a large scale for military purposes, and when the results achieved also proved of service to economic ends in times of peace, this line of development was pursued still further.

As a result, university education has tended to be dominated by the natural sciences and technology. Teaching is swept along in the forward rush of specialization, an irresistible process which is threatening to dismember knowledge, splitting it up into a number of separate compartments without visible connection. The looser the connecting links, the more teaching has been undermined as an educative force. Specialization and general education are demands difficult to reconcile. This is one of the most important aspects of the conflict in which higher education is now engaged and of which it has only become truly aware since the war – judging, that is, by the countless treatises devoted to the subject nowadays.

Thus we are at present going through another period of crisis, one in which academic education is once again busy re-appraising its fundamental principles, in a search for new forms to accommodate the sweeping changes resulting form new developments in knowledge and society. In this situation, the university discerns a threat to the traditional values it has succeeded in preserving down the centuries. Through all the many problems involved – nowadays discussed mainly in isolation from one another – runs the red thread of a few root problems which affect the very nature of all university teaching and throw into relief associated problems.

But, the outsider may say, the universities and other seats of higher education have never before enjoyed such prestige as they enjoy today. Students are being enrolled in unprecedented numbers and these numbers are always on the increase. There is similarly a continual increase in the number of chairs, laboratories and institutes (fitted with the most expensive equipment), and the community gladly grants the funds required for this purpose. No one would think of attempting to hamper this forward advance. Why, therefore, speak of a crisis? Indeed – if quality could be measured by quantity things have never been better.

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* Based on a lecture delivered to the Delft Students Debating Society by Mr. H. J. Woltjer, general-advisor at the Ministry of Education, Arts and Sciences.

And it is not only outsiders who think like this. Have not the universities, generally speaking, come out against the idea of having more centres of university teaching? If only the government will provide the necessary means for greater accommodation, more staff and more material in order to absorb the increase in the number of students, the universities can do the rest. There is very little sign of concern about the effects of "mass education" and the demands of modern scientific research on the values of academic education. The only matter of concern is that the founding of new universities will have an adverse effect on scientific research, which requires the highest possible degree of concentration in order to keep specialization up to the mark. This is one of the main theses of the report submitted by the Casimir Commission on the development of natural science research. Is this argument not decisive? If the dominant factor in university life is formed by the demands of modern science, is there any point in still talking about "academic values" which are bound to suffer as a result of inevitable specialization? Does not every specialization also have a general educational value? Is not the general only to be recognized through the particular? If the roads of access to the special areas are, indeed, becoming narrower, should one not accept this disadvantage as an unavoidable result of science's advance? And have we not the "studium generale" to compensate possible shortcomings in specialized study? In short, what are we, who want to put university education into dry dock, really worried about?

But there are other voices which sing a different tune. The movement for reform originated in the war. At a time when freedom of thought was severely restricted, higher education became highly aware of its own responsibilities. Men of stature, like Huizinga and Meyers, had already pleaded the need for reform, but at the time they met with no response. It was the war that wakened the universities out of their slumber. People began to ask themselves whether academic education, locked for a long period of rest in its ivory tower, had kept up with developments in science and changes in a society churned up by war. There was a desire to enter upon the new era in a new spirit, one in which the old values were re-assessed. New ideas were developed, new plans drawn up for the future. This led, in 1946, to the appointment of a State Commission on the reorganization of higher education. "It is urgently necessary," remarked the Minister of Education, Van der Leeuw, in his address on the occasion of the commission's installation, "that science and education should be a centre of strength in the great process of rehabilitation now going on in the world. And the aim must be not merely to restore what has been destroyed, but to achieve a true renewal. Those who in our time merely patch things up out of financial or other considerations, are not building; they are digging a grave. Therefore the whole of education, in all its aspects, must be re-assessed and reformed. It was no mere chance that the plans to reform higher education should have been the fruits of the Occupation. The fight involving the universities made all the citizens of the academic community powerfully aware that, as a moral entity, the university was bound on all sides. It was as difficult for it to exercise its own responsibility as its own ability to take decisions. Higher education is not teaching alone; it is training for free and conscious humanity."

This campaign for a spiritual renaissance became stranded in the difficult legislative work which was to provide the formal basis for the requisite reorganization. When everything had more or less assumed its normal course again and everyday problems had got the upper hand, the enthusiasm of the Occupation years died down. The "studium generale" was introduced, it is true; but for the rest "waiting for legislation" was seen as a fine excuse for postponing the assault on fundamental problems until some future date. This was all the easier, since one's immediate attention was fully occupied by attempts to catch up with arrears of knowledge, to meet the needs of research, which now demanded instruments of a size and expensiveness never before dreamed of and also to solve the many problems raised by the huge influx of students, for which the universities were, likewise, unprepared. I'm not saying that everything else was left as it had been. That would be to do some, particularly the Technological University at Delft, an injustice. I fully recognize the significance of the measures taken to improve education and to expand the universities' administrative capacity; but these measures were more or less spasmodic and were only incidentally concerned with the deeper lying problems in the forefront during the Occupation and at the time the State Commission was deliberating.

In addition to fostering science, the State Commission wanted one of the aims of the public universities to be the promotion of the spiritual and moral education of their students and the development of a sense of social responsibility, which would be linked to the spiritual values which have characterized our nation in the course of its history, values determined by Christianity and Humanism and finding their chief expression in respect for one's fellowmen. The desire was to find a definite formula for the spiritual foundations of the university since, generally speaking, it had in the past been insufficiently aware of these foundations (so far never fully expressed in words) and of the task that resulted from them, both in its own and in wider circles. This was seen as a challenge to all the members of the academic community to remain loyal to the university as one of the principal centres of culture. To this end it was proposed that a "studium generale" should be introduced, the aim of which would be to increase the students' understanding of the unity and coherence of the sciences, the nature and methods of each individual science, and the spiritual foundations of Dutch civilization, while strengthening their sense of responsibility for national and cultural values.

The first draft bill incorporated these ideas in simplified form. In the explanatory memorandum, we read : "For some considerable time now it has been felt that the aim has been too much concerned with the shaping of the intellect and the satisfying of practical needs. It is therefore important to lay down in the act that a certain development has taken place since the old act of 1876 was passed."

Cals, the present Minister of Education, originally included only the aims as stated in the old act in his draft bill. This was not because he could not subscribe to the idea but because he considered it superfluous to lay it down in the act. Explaining his viewpoint, the minister said : "The shaping of the personality is indissolubly linked up with higher education. It goes without saying that attention should be paid to furthering an understanding of the unity and coherence of the sciences, for this touches the very core of university education. It is true that at the present time this education's main task is to train specialists, but specialists who are aware of the relative significance of their knowledge. There is definitely no objection to our universities training the specialists that society needs in increasing numbers. Specialization need by no means do prejudice to general cultural education. But specialization must not be allowed to lead to the student – and later the graduate – isolating himself from everything outside his own special subject. We may expect from the true academic that he should take account of the place his own special knowledge occupies in the whole, of which it forms only part, and that he should have an understanding of the coherence of the sciences and of the foundations on which our culture rests. Some professors succeed in inculcating this awareness and understanding in their students through the influence they exert, often unconsciously. But this is not a rule. It is certainly to be recommended, therefore, that the university should itself attempt to provide an opportunity for this kind of academic training in other ways as well, for example, by means of the "studium generale", by incorporating philosophical subjects in some courses."

Since he took this view, it is not surprising that the minister should have had no objection to something of this idea being incorporated in the new act by way of amendment to his bill. Thus the act now says that academic education should foster an understanding of the coherence of the various sciences and that it should also devote attention to fostering a sense of social responsibility.

However, the act does not go on to say how this should be done in practice, and when one considers that specialized study already requires the student's full time and energy, there is obviously a great danger that the words of the act will remain mere words. But there is no clear solution. No faculty or department can, however, escape the fact that according to the act and the accompanying memorandum it is part of the very essence of university teaching to transmit to the students an understanding of the unity and coherence of the sciences and of the principles on which our culture is founded. The act makes them explicitly responsible for designing the curricula and it is therefore their task to see that this essential element in university teaching is not neglected. The "studium generale" does not relieve them of this responsibility either. It provides no real solution to the problem. The State Commission had already expressed the fear that a "studium generale" which did nothing more than provide an opportunity to listen to a number of lectures would degenerate into a caricature. The "studium generale" has been no more of a succes here than it has been in Germany. It is too loosely associated with the rest of the student's studies. The problem cannot be solved by regarding specialized study and a general, cultural education as two separate entities. This is an inadmissible antithesis. General and cultural education should be harmoniously assimilated into teaching and form an integral part of it. In the teaching that some professors give this is undoubtedly being done, as the minister had already noticed, but to rely on this is not enough. This element of education should have a place of its own in the curricula.

For this reason I look upon the view expressed in the Casimir Report – that it is only by allowing students to take part in original scientific work under the guidance of capable teachers that higher education in the true sense of the word can be given – as far too narrow. Academic education covers far more than this.

"The immediate result of uncompensated specialization," remarks Ortega Y Gasset, "is that, while today there are more "men of science" than ever before, there are far fewer people of all-round education than there were, for example, in 1750. And the worst of all is that these additions to the scientific machine do not even guarantee the inner progress of science."

Ortega Y Gasset is of the view that the endeavour which has resulted in the supremacy of research in the universities has had a fatal effect. It has meant that the most important thing of all has been left out – culture. "There are large areas of science which have nothing whatever to do with culture but which are simply scientific technique." He points to the historical importance of "giving back to the university its main task of enlightening men's minds and of teaching the culture of the age in its entirety so as to reveal the present, gigantic world clearly and precisely, the world into which our living has to be integrated, if it is to be authentic" and advocates that a "faculty of culture should be made the very core of the university and of all higher education".

As a compensation for the ill effects of specialization, Ortega Y Gasset puts forward a demand for the concentration and simplification of knowledge. "A type of talent must be fostered and trained which is specifically comprehensive in nature. The whole future of science is bound up with this. Fortunately, the leading figures in present-day science have found themselves forced by the intrinsic demands of their own science to complement their special knowledge with a comprehensive culture. Everything is moving towards an effort to achieve a new integration of knowledge, which at the moment lies in fragments." "The need to create powerful syntheses and the systemization of science, in order to be able to teach these in the faculty of culture, will nurture a type of scientific talent which has so far occurred only by accident: the integrating talent. The movement which drives scientific research to keep splitting itself up to deal with special problems, to pulverize itself, demands some compensatory measure, as does every healthy organism, some movement in the opposite direction, to control and restrain science's centrifugal tendency."

"The sciences must pitch their tents around the "minimum university" – their laboratories, seminaries and discussion centres. They should form the humus in which higher education has thrust its eager roots. The university should, therefore, remain open and accessible to everything which comes out of laboratories of all kinds and at the same time do its own work on these results. Both – the university and the laboratory – are distinct but complementary entities within a single organism."

"Higher education and research have a harmful effect on each other, if an attempt is made to amalgamate them instead of allowing them to proceed side by side, influencing each other powerfully but in complete freedom, continually but spontaneously. Though the university cannot be dissociated from science, it is not the same thing."

I have deliberately set these views of Ortega Y Gasset alongside those of the Casimir Commission. They may not differ entirely in fundamentals but they do lay the emphasis entirely differently. The Casimir report places the laboratory in the very heart of the university, Ortega Y Gasset places it outside its walls. Is a synthesis possible?

In order to be able to give a better answer to that question later on, it might be useful to take a quick look at some of the crucial moments in the university's history. Knowledge of the past leads to a better understanding of the present. Tracing the university's development, we observe how general education has gradually had to yield ground to specialized subjects and the demands they make. In the medieval university, the student was only admitted to the specialized subjects of theology, law and medicine, after having completed a general propaedeutic course. This covered the seven liberal arts, studies which liberate the mind and foster those capacities which are indispensable to the free man. With the higher, specialized studies, these comprised practically the whole arsenal of knowledge then available. Teaching was based on the unity of science, which in turn formed a whole with the social life of that time. Both found their deepest foundation in the Christian faith. Teachers and students also formed a unit. It was from this double unity and this link with life ouside its walls that the medieval university drew its prestige and authority.

These it maintained until the rise in the 16th century of the natural sciences and Humanism. Instead of taking the lead in these fields, the university clung desperately to medieval forms and ideas. It looked backwards instead of forwards. It proved incapable of absorbing and assimilating the new trends in science and thought. Many great scholars of the period were not attached to the universities. When the new science began to develop on a large scale during the 17th century, new centres of learning were set up independently of the universities, the Science Academies. The university was no longer able to make good its claim to universality, and this had its effect on teaching. During the 17th century the universities were teaching institutions which turned out only mediocre preachers, teachers, lawyers and doctors. A doctor was regarded as a person living in the modern world whose mind was still in the Middle Ages. The universities had become bogged down in tradition. Unable to incorporate science in their teaching, they fell behind, for, as a result, they were also unable to base their teaching on the new developments in science and on the new ideas of the age. This phase came to an end when, as already mentioned, the Germans at the beginning of the 19th century accorded to science the leading place in the university's aims. "The unity of research and teaching" was from then on the principle that determined the university's foundations. It became the vital ideal of the university to serve science, the aim of which was to search for truth, and to inculcate an enthusiasm for science among its students.

As long as this science still formed one whole more or less, this association of teaching with research meant nothing but good for university teaching. But when scientific research became more and more specialized and further and further removed from its philosophical foundations, it began to exert a deleterious effect on teaching. For its further development, science was obliged to restrict itself to increasingly narrow fields, whereas teaching, certainly in the first years, requires a broad foundation. The requirements of science and teaching have grown wider apart as time has passed, with teaching falling further and further behind. It is only in the later years of study that there is any healthy concurrence between the two.

Specialization in science went parallel with the development of society, which in many ever-extending fields profited by the applicability of the findings of science to practical ends. Society encouraged specialization and called for an increasing number of men with an academic education who had made themselves experts in special fields. In this way science and the teaching founded upon science came to be dominated by specialization and practical application.

This trend was further accentuated in our country when the Higher Education Act of 1876 removed general, preliminary study from the university and made this the task of the grammar school, which was regarded as a part of university training and which had rules laid down for it in the same act. In actual fact, however, the grammar school has developed on its own lines, largely independently of the demands of university teaching, and, together with the secondary school, which from 1917 on also became involved in higher education, it has only succeeded in fulfilling part of its task of providing a general propaedeutic course of education. A lacuna resulted in higher education, which it has been attempted to fill by the introduction of the "studium generale", but this, as has been said, has not amounted to any real solution. This course of development shows how the university has come, slowly but surely, to find itself in its present precarious position. It is the result of a long historical process. In his excellent small work, *Technology and the Academics,* Sir Eric Ashby has put it as follows.

"From Bologna and Salerno comes the function of the university to train students for certain professions, like the church, medicine, and law. From Oxford and Cambridge comes the university's function as a nursery for gentlemen, statesmen, and administrators. From Göttingen and Berlin comes the function of the university as a centre for scholarship and research. From Charlottenburg and Zürich and Massachusetts comes the function of the university to be a staff college for technological experts and specialists . . . The universities have responded to all of them and repudiated none; but adaptation is by no means complete. Form is not everywhere fitted to function. Indeed the cardinal problem facing universities today is how to reconcile these four different functions in one and the same institution. Our universities have not solved this problem. Each university has adopted its own temporary compromise, dictated by expediency . . .

Here lies the cause of those symptoms of split personality which are evident in British universities today. Universities are enjoying immense popularity. Their prestige has never been higher. They turn a confident face to the world, but when they look at themselves in their own academic mirror they see apprehension. These symptoms of split personality are not caused by doubt as to whether any of the four functions of the university should be accepted or repudiated; . . . the symptoms are caused simply by the fact that adaptation is incomplete. The consequence of incomplete adaptation is tension." This is the picture Sir Eric Ashby paints.

Higher education is indeed confronted with an almost impossible task. The new science which it neglected in former ages but embraced during the 19th century has proved to be a young cuckoo, snatching all the food for itself and threatening to force teaching out of the nest. How can the university satisfy all the very diverse needs of science and education to the same extent and avoid doing less than justice to any one of them? More has to be accomplished; it has to be better accomplished, and in a shorter time. Forces have been conjured up which threaten to bring about the university's dissolution. They are all centrifugal forces and the university can do little to counteract them, imperfect as its structure is. A solution cannot be found by tackling any one task in isolation from the others. By attempting to improve the execution of one task, one may hamper the execution of another. Solutions based on compromise cannot supply a final answer. How is resistance to be offered to the disintegrating influences of specialization, which are reducing the universality of science into so many fragments, and to those of society, which asks for tangible results and reduces knowledge to a merely material quantity ?

Originally, the university was a dual unity, comprising the unity of science and its own corporate unity. These were the guiding principles which determined its action in the past and which have paled into insignificance during the present century.

Even today the university should still base itself on the principle of its unity.

It must not abandon this ideal, even though it may seem even more difficult to achieve than ever before. Gierke has pointed out that every institution which no longer draws its inspiration from the ideal it set itself when it was founded inevitably disintegrates as a living community. The symptoms of degeneration he discerns are: corporative egoism, privilege-seeking, exclusivity, narrow-mindedness. For the members of the university the corporative link ought to be the higher, moral community in which the individual surrenders part – and a very real part – of his personality for the good of the whole. This applies to each individual and to each department, professors, faculties and departments, staff and students.

The old higher education act of 1876 paid no attention to the university as an organism, as a living corporate body. It was inspired by the abstract principle of freedom. Freedom for the professor, with whose teaching and knowledge neither the state nor the university itself should interfere. No prescribed curricula or timetable. Freedom, too, for the student, who should be left to judge his own progress himself. Freedom, that is, in study and in examinations. Academic study does not tolerate regulation.

Up to a point this is true. The most essential elements of university teaching do not allow of regulation. But this does not mean that the structure and functioning of the university community of teachers and students must remain unregulated. It was due to the absence of any firm internal structure that the forces which brought about the disintegration of "universal knowledge" into isolated departments were able to operate freely on the unity of the university as a corporation, the "universitas magistrorum et scholarium".

It is understandable that in the situation reigning in the 19th century relations between teachers and students should have presented no problems. In the university community of those days, with its limited numbers of students, the natural conditions were present for real contact between the two. This is evident, for instance, from the "Organic Resolution" of 1815, which governed higher education before the 1876 act was passed and in which we read of: "the students proper, who attend the professors' lessons and are therefore known to their teachers". The resolution also says that the lessons might be given in the professors' own homes and that there should be as much tutorial teaching as possible, with discussions and debates, as in the past. Since those days, however, the situation has undergone a drastic change. The number of professors has multiplied and multiplied, it is true, but to nothing like the extent to which the number of students has; moreover, the increase in the number of university chairs has usually resulted from the widening of knowledge and not from the growth in the number of students.

The university has outgrown its strength. It has used its resources in a one-sided way to keep up with the advance of science. Yet it cannot be severely blamed for this. It could not allow itself to neglect science, for then the source from which it draws its life would have dried up, and its teaching would have merely consisted of the passing-on of secondhand knowledge. The university's dilemma lies, however, in the ineluctable demand that the attention it devotes to science should not be at the expense of its teaching. The practice of science calls for the most intense effort. Research in the natural sciences demands so much equipment and prior preparation that scientific work threatens to be wholly given to organizing and guiding others, so that the concentration and quiet required for the private contemplation of the deepest problems are lost. Society, too, makes frequent claims on the expert advice of university professors. Many of them are the slaves of their timetables, their list of appointments. Teaching suffers as a result of this situation as well.

There are so many students that it is impossible to get to know them personally, let alone maintain constant, lively contact with them. No wonder then that the students should feel threatened. Teaching is becoming an impersonal affair, degenerating into organized training, the completion of a set programme, instead of a course of academic study. This trend is increasing, since it is necessary to apply limits to the duration of study in order to keep it within certain bounds. The students feel they are the mere objects of educational regulations and their only defence is to appeal to "freedom of study," meaning by this "freedom not to study" as well. To an extent they have a right to this too. No one will deny that, but that this freedom should be unlimited is "eine Konsequenz, welche zum Teufel führt".

In the Commission's report on "measures to be taken on behalf of the students" a separate chapter will be found devoted to "The student and his place in and at the university". In this chapter there is a powerful plea for better contact between the teachers, staff and students. We read: "The university should endeavour to arrive at such forms of contact between "seniores" (professors, members of the staff and, indirectly, graduates) and "juniores" (the students) that co-operation in scientific research and teaching leads to reflection on the coherence of the sciences and to acquaintance with other expressions of culture besides those in their own field of study. It ought to reinforce awareness of solidarity among the highly variegated university "population". This should be expressed in personal contacts between "seniores" and "juniores" and in a form of student life, differentiated according to personal preference, yet nevertheless coherent."

The commission cannot make any concrete recommendations for the fostering of this contact, which is mainly dependent upon the willingness of the two parties concerned. It is necessary, however, that the material conditions should be created in which contact can be made.

Almost all the proposals the commission made for the improvement of student amenities have been busily discussed and accepted without much hesitation. Only those made with regard to improving the personal climate of teaching have been largely ignored. Higher education is indeed developing a science of human relations, but it applies this science to itself, with but little consistency.

In practice these ideas are taking shape in seminars to which the students themselves contribute, in the appointment of tutors and in others forms. Numerous professors have already been active in this direction for some time now though in university policy these ideas have yet to secure a real place.

In the Casimir Commission report, personal contact between teachers and students is only seen as being significant in the later years of study, when students begin to be included in research work. The rest is regarded as formal education, which the students must work quickly to raise to the level at which independent work must be done.

I am of the opinion that lively contact between teacher and student in the first years of study is every bit as important, if not more important. This can be immediately countered, however, by saying that the professors, overburdened as they already are, cannot possibly find time for this. This cannot be denied, but must we not draw the conclusion from this that teaching not strictly associated with the professors themselves should be entrusted to younger teachers? Huizinga named as one of the chief reasons for the lack of a true sense of community at the university the lack of any middle group between the professors and their students, a group which, closely associated with the university, can function as a link, as intermediaries. "If it is true that what such an academic community (a true, scientific community, a true "universitas" in the oldest sense of the word) needs most of all is a middle group of young academic workers, which can guide those still younger than themselves and help and support those older than themselves, these people are to be found among the assistants, the tutors, the curators of museums, the private tutors and also the teachers who succeed in maintaining some contact with the university". In this way the debilitated communication between lecturers and students can be rehabilitated. It can only be to the good of the scientific and academic staffs that they should be more systematically concerned with the teaching process.

If I advocate this course in an attempt to solve the many problems with which our higher education is struggling, this does not imply I anticipate that the ancient unity of science and academic body which was characteristic of the university in former ages is again within our reach. This is excluded by the present state of knowledge, with its countless special branches, by the highly differentiated requirements of society in the way of academically trained people, and by the large number of students. But I do think that we can accept the old idea of the essential character of higher education as the basis for all attempts at reform. In his work *The Universities of Europe in the Middle Ages,* Rashdall describes the university as a place where the different branches of knowledge are brought into contact and harmonious combination with one another, to make possible the life of study whether for a few years or during a whole career, and to bring together during that period face to face in living intercourse teacher and teacher, teacher and student, student and student. What is required in every course is an intensification of real contact between teachers and students. I anticipate a higher return from that than from any efficient regulation of teaching or examinations. Outside the laboratories, too, students should participate in the teaching rather than play a merely passive, receptive role. Certain "rules of the game" will be required for this as well, though they will no longer be felt as a threat to academic freedom. Such freedom will then operate naturally via regular meetings between teachers and students as part of the teaching, and between the teachers themselves and the students themselves outside the teaching.

But this has not provided an answer to the question as to how the demands of specialization are to be reconciled with those of a general education. How are the various branches of knowledge to be brought into contact with one another, and harmoniously combined with one another, during a course of academic education of limited duration? What substance is higher education going to give to the task conferred upon it by the legislator to foster an understanding of the coherence of the various sciences? Are the views of the Casimir Commission and those of Ortega Y Gasset reconcilable ?

These questions represent the main theme of the small work by Sir Eric Ashby which I quoted earlier on. He says that technology in universities could be made to play an important part, it could become the cement between science and humanism . . ., technology could become the agent for assimilating the traditional function of the university into the new age. For technology is inseparable from men and communities. In this respect technology differs from pure science. It is the essence of the scientific method that the human element must be eliminated . . . Technology concerns the applications of science to the needs of man and society. The technologist is up to his neck in human problems whether he likes it or not . . . The social consequences of his work are an integral part of his profession . . . . . What the future physicist, chemist, or engineer lacks in his training is not an understanding of art, of history or literature. It is not primarily a lack of subject-matter at all. The fault lies in what Whiteland called "a celibacy of the intellect which is divorced from the concrete contemplation of the complete facts". It is a preoccupation with abstractions from reality, an escape from the whole of reality. Thirty years ago Whitehead warned us that this would become the great danger of professional education. Each profession makes progress in its own groove of abstractions, but there is no groove of abstractions which is adequate for the comprehension of human life . . . . . A factory, with its machinery, its community of operatives, its social service to the general population, its dependence upon organising and designing genius, its potentialities as a source of wealth to the holders of its stock is an organism exhibiting a variety of vivid values. What we want to train is the habit of apprehending such an organism in its completeness. This could be achieved by making specialist studies the core around which are grouped liberal studies which are relevant to these specialist studies. But they must be relevant; the path to culture should be through a man's specialism, not by by-passing it . . . A student who can weave his technology into the fabric of society can claim to have a liberal education; a student who cannot weave his technology into the fabric of society cannot claim even to be a good technologist.

I think that this argument of Sir Eric Ashby's, built up on Whitehead's ideas, really does indicate the way in which a synthesis of the different views can be sought, though this applies chiefly to the technological universities. It would require further consideration before it could be applied to the ordinary universities.

I cannot go very far into this now that the minister has appointed a commission on "technical studies and the social sciences", which will doubtless encounter problems of general and specialized education during its work. If it is desired to tackle the question from this angle, teaching methods will have to be overhauled as well. If, for example, some new industrial enterprise is taken as an object of teaching, in order to throw light upon it from various sides related to the actual situation, this cannot be done by allowing each professor concerned to treat his particular bit from his particular angle. This would not only take far too much time but would also fail in its aim. The project calls for close collaboration among the professors and their assistants and the active participation of the students themselves. Otherwise there would be a great risk of failing to obtain any real insight into the way in which the several facets of the undertaking influence each other in practice. In universities abroad the "conference method" is employed to this end. As an outsider, I cannot judge how far these ideas could be put into practice. Should it be possible to do so, something of the ancient idea of the "universitas" would in this manner be resurrected, both the "universitas scientiarum", the unity of the sciences, which come into direct contact with each other in this sort of teaching, and the "universitas magistrorum et scholarium", the academic community, which acquires solid substance by means of the close co-operation among teachers, staff and students.

THE TASK OF THE LITERATURE SEARCHER*

At the stage which scientific work, whether at the universities or in the laboratories of institutions and business enterprises, has now reached, it is of essential importance that we should consider what the task of the worker in literature research can be in this context and what is required to make him a good literature research worker. The term "literature" belongs to the world of the library, that of "research worker", whom I shall further refer to as "searcher", to the world of science, and indeed I do not think we could put in better than to say that the literature searcher is the link, the liaison officer, between these two worlds.

How has it come about that this new group, the literature searchers, should gradually have arrived on the scene, have come to occupy a place between the man of science and his library, when even today there can still be no better person than the scientist himself for the job of investigating literature in order to solve his problems? There are two reasons. The first is *that the man of science is desperately short of time.* As an illustration, I will quote the weekly timetable of Professor C. J. Gorter, director of the Kamerlingh Onnes Laboratory at Leyden, as given in an interview published in a Hague newspaper last year. Professor Gorter's 60–65–hour week (that is already rather more than the average man works) is occupied as follows:

10 %	teaching (lectures and oral examinations)
10 %	organizational work for the laboratory
30 %	research guidance and assistance on dissertations
15 %	keeping up with scientific literature
20 %	functions in Dutch science organizations
15 %	functions abroad and travel

This means that Professor Gorter spends about 1½ hours a day on keeping up with scientific literature. That is quite a lot of time, when one sees how much a professor has to do. I do not know whether all professors manage to reach the same figure, but several of them have told me that in their cases it is out of the question. But even if they were able to give even more time per day to the study of literature, it would still be inadequate in view of the enormous quantity of literature which now appears in practically every special field. And it is not only the reading that requires time; thinking about what one reads, testing out the ideas of the other man of science, quiet assimilation of what is read – al these require time, perhaps more time, too.

During the, say, 1½ hours per day given to reading one should also read the most important matter, i.e. make a wise selection before the reading matter is taken up. How is such a selection to be made? Should one take the easy way and choose the leading journals? Or should one call in the help of one's assistants and give them the task of attending to important publications? In the latter case, the man of science is already on the way to making himself dependent on others in his study of literature. And such a course is really the obvious one.

I would say that a man of science *ought* not to devote more than 1½ hours a day to studying literature. The analysis of Professor Gorter's timetable shows that a great deal of time is absorbed by organizational and representational matters, a total of 45 %. So 10 % is left for teaching and 30 % for creative work. And it is this last item that matters.

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* Text of a lecture delivered on March 22, 1961 at the Literature Research Workers Centre at Eindhoven by Dr. L. J. van der Wolk, librarian at the Technological University, Delft.

Reading is acquainting oneself with the ideas of and results achieved by others. There should be a proper balance between reading and doing creative work oneself. In order to achieve such a balance, the man of science will need the help of other people, literature experts, literature searchers, in the same way as he receives assistance from others in his scientific work, his organizational work and in his teaching too.

The second reason why assistance should be sought in keeping up with scientific literature is that *the man of science is no longer able to cover the entire range of his own branch of literature.* He is unable to go sufficiently deeply into it to be sure he has missed nothing of importance. The volume of literature has now assumed enormous proportions, it is highly varied in its form of publication, appears in languages which the man of science does not himself read, and is often published in "micro" form, which is not very attractive; all these are factors which hardly make it suitable for the daily 1½ hours reading. Some of it is not, in fact, actually published, though it is available. It is quite comprehensible that the man of science should have the feeling that this instrument is slipping out of his fingers and that he should ask for assistance, from one whose task it is to be kept fully informed on the subject.

What requirements should be made of this assistance – the assistance given by the literature searcher? I would mention the following :

1) *a good knowledge of his own field of science or technics* (physics, chemistry, mechanical engineering, electro-technics, agriculture, or even medicine, law, etc., etc.). This is the primary and principal requirement. Without such knowledge there is no point in being a literature searcher. Professor Gorter could certainly not use anyone other than a good physicist as his literature assistant. How could he give him his instructions and how could the man carry the research work out, if this were not so? Moderate expertness is inadmissible, since the scientist is dependent upon the expertness of his literature assistant. To emphasize one aspect of this point: it is not a question of using a mechanical engineer, for instance, as a literature searcher, because he lacks adequate knowledge to be employed in mechanical engineering. It might very well be possible, however, that a good mechanical engineer who is not in the right place in an engineering firm owing to lack of leadership qualities, for example, would become a literature searcher. It is not lack of knowledge, but a quality of character, that decides in such a case.

2) *ability to realize his position as a link between the scientific research worker and scientific literature.* Thus the first thing required in addition to knowledge in a specific field is a positive quality of character; and this is indispensable too. The literature searcher who lacks this quality, who can only be happy when applying the results of his studies in practice, will not be succesful in the long run. He must be able to accept a commission, furnish the required material, and then begin again on a new commission.

The literature searcher must have something of the journalist in him, a nose for what will interest other people. Also something of the dealer, who does not make things himself but sells them for someone else, after having, where required, put them into shape, packed, or mixed them in the right proportions. In all these cases speed in supplying the reports or the goods is an essential factor. The literature searcher ought really to have a pair of wings and may be he will grow a pair at a later stage in his evolution. But to get back to realities: he must be mobile. His chief and the person who gives him his commission to fulfill must allow him freedom of movement, the same freedom without which no-one can be a successful journalist or dealer, a freedom, moreover, that is one of the attractions of the profession. Put the other way round : a literature searcher who simply remains stuck to his chair and never leaves his university or firm's premises, since he feels no impulse to, will never be a success. "A bird on the wing always catches something" might be a good device for the literature searcher.

3) *like every other man of science, the literature searcher must be internationally-minded.* The place on the earth's surface where the information useful to the person commissioning the literature searcher happens to be, or the language in which it has been published, is of no importance. It is not so very long ago that one could say that the "production" of knowledge in the natural sciences and technology was limited to what we call "the West", and then for a long time to Europe within this "West", and even to a particular part of Europe. This age is now completely past.

We are all aware of America's potential. As far as Russia's scientific achievements are concerned, the West's eyes have only recently been opened, but they are now wide open. As to China's advance, the West is at the moment definitely disturbed about this. But we do not have to think in the power terms of the big political blocs. Practically every country, every new country as well, is devoting its full attention to encouraging scientific research and producing valuable literature of its own. Neither must the literature searcher allow the language barrier to be a barrier to him any more. I take it for granted that he will be able to read French, German and English without difficulty, and also be reasonably proficient at speaking them. If he lacks this elementary proficiency he can hardly claim to call himself a literature searcher. If he knows other languages too, so much the better. If he knows Russian he will find there is an urgent demand for his services, and if he acquires a knowledge of Chinese, he can make himself highly useful. In any case, he must be aware of the possibilities of gaining access to literature which is termed "difficult of access" owing to the language barrier : In The Netherlands there is a foundation for the purpose and there is to be the European Translations Centre for Europe as a whole.

But still more important than knowing how to lay hands on data, wherever it may be produced in the world and in whatever language it may be written, is, in my view, an international outlook in the literature searcher, the kind of attitude to life which makes his mind range freely in the world, makes him look across frontiers, makes his horizon unlimited.

4) *ability to express himself in speech and writing.* The literature searcher must be good at consultation. He must know how to listen to the man giving him his commission, when the latter is explaining the particular scientific or technical difficulty for which he wants the research done. He must know how to put the right questions to the scientist and to formulate the commission in the terms of literature research. After partial or complete research he must be able to go back to the scientist for further consultation and to discuss the results, and also be capable of making suggestions for further or modified research projects. In addition, he must be able to conduct pleasant and expert consultations in the other direction. Not all doors will be open to him in his reseach and he must know how to get them to open. When the research has been completed, a well-written report must be prepared and submitted

to the man giving him the commission. The report must be businesslike, giving an account of the research done and its results, in line with the train of thought of the scientist who has asked for it. For the latter it must represent an instrument for further action, but it must also be constructed in such a way that it contains all the information necessary for consultation at a later stage. In other words, it must be useful as a record in the archives. These are severe demands.

On the one hand the report must be attractive and readable, otherwise it will simply remain unread – that is how things go. On the other hand, it must be a complete document. This, too, is a demand made by the impatient man of science commissioning the research when, finding at a later date that much of the material he had hoped to memorize has become vague in his mind, he asks for the report again. All this calls for great skill in the literature searcher in writing systematically, clearly, purposefully, accurately and in precise terms, and in addition, interestingly. Obviously he must have a good command of language.

5) As if this were not enough, the literature searcher must also have learned *to carry out literature research in expert fashion.* He must be at home in two specialized fields: his own, original field – mechanical engineering, chemistry, sociology, etc., and a new field, that of literature research. He might be compared with a patent's engineer, who was an engineer to begin with and has later made himself an expert in the law relating to industrial property rights.

For some years now a course of training for literature searchers has been included in the curricula of the Joint Educational Committee of the Netherlands Society of Librarians and of the Netherlands Institute of Documentation and Registration. The course deals among other things with research and reporting. Now that this profession has passed through the first years of its evolution, the course could, in my opinion, usefully pay more attention to the "geography of the library world"... to the factories which produce the goods. Another point worthy of attention is knowledge concerning the structure of each individual special subject. For instance, it has been noticed that literature in the field of atomic energy, one of the very latest fields of literature, has assumed a structure entirely different, for example, from that of mathematics. New forms of publication are being tried out. The amount of literature is increasing enormously. A really thorough study of the literature in one's own special field is required if one is to offer one's services as a literature searcher. Seen the other way round, it is precisely the requirement of having this special knowledge at one's disposal that makes it essential for the man of science to call in the assistance of the literature searcher.

Thus we see that the literature searcher we need is a liaison officer between the scientist and his literature and that he belongs to the world of science rather than to that of the world of the library. If his services are to be made good use of, it is necessary that the scientist, whether a professor or a research worker in the laboratory of some industry, should look upon him as an assistant who takes charge of the special field of scientific literature for him. That the literature searcher is consequently closely concerned with the libraries is obvious. Organizational links with the world of the library and of documentation via The Netherlands Society of Librarians and The Netherlands Institute of Documentation and Registration are consequently highly desirable. Links are also necessary, however, with the world of Dutch science, although these will probably be more difficult to establish in view of the rather loose organization of science in The Netherlands.

THE NEW HIGHER EDUCATION ACT

On January 1, 1961 the new Higher Education Act became law, replacing the old Higher Education Act of 1876. Naturally, the latter act had undergone frequent modification and supplementation during the 84 years in which it was in force. Among the significant changes were: the promotion of the Polytechnical School at Delft to the status of Technological University in 1905; the change brought about in 1917 by which the final examination certificate at the "secondary modern" schools secured admission to various university courses; the decision in 1921 to lay down the examination regulations and conditions for award for the doctor's degree in a separate Academic Statute, which Statute appeared in the same year; and the change in 1956, when a second Technological University was founded, at Eindhoven, and both this and the university at Delft acquired the status of bodies corporate.

Early plans for reform laid down in a report of 1910 delivered by a commission which had been set up as early as 1903, failed to materialize. In 1946, however, another commission was appointed, which submitted its report in 1949. A further commission was then charged with drafting a bill to incorporate the recommendations of the commisssion first-mentioned. Its report, which was ready in 1951, served as the basis of a bill laid before the Lower House in 1952. The House issued an interim report on it in 1954.

Various new developments, such as the founding of the Technological University at Eindhoven, the question of subsidizing the private universities at Nijmegen and Amsterdam and the Municipal University of Amsterdam caused the minister to decide to overhaul the bill.

A commission was charged with the task of revising the draft, and on Jauary 30, 1960, a revised bill was submitted to Parliament, accompanied by an explanatory memorandum of considerable proportions. The bill was passed by the Lower (Second) House in October 1960 and by the Upper (First) House in December.

The new act is part of the new legislation on education which was outlined in the minister's second memorandum submitted to the House in 1955. This memorandum divides the Dutch system of education into four sectors : infant education, basic (elementary) education, further education and higher education. The minister's aim has been to lay down general legislative regulations for each sector, so that education in the Netherlands is covered by four comprehensive acts.

The first act, on infant education, was passed in 1955. As far as elementary education is concerned, a few technical changes in the elementary education act of 1920 will be necessary, as soon as the third act, on further education, the draft of which has been under consideration since 1958, has been passed. This leaves us with the fourth act, the Higher Education Act.

The expression "hoger onderwijs" (higher education) has been replaced in the name and contents of the new act by the term "wetenschappelijk onderwijs" (scientific education). This is not because something different is indicated by the new term but because the old term might now cause confusion in view of new forms adopted by further education, in which the term "higher" is also used (e.g. we speak of the "higher technical school", a school where advanced technical education is given at the secondary level). Though clearer in Holland itself, the new expression may give rise to confusion abroad, since the word used in Dutch "wetenschappelijk" (scientific)

covers both the sciences and the arts. For reasons of convenience we shall go on referring to 'higher education'.
According to the terms of the new as well as of the old act, higher education comprises: training for independent work in the sciences and for jobs in society for which an academic education is required or can be useful. The new act also says that along with teaching the universities and other institutions of higher education definitely aim at the pursuit of learning, while they also devote attention to fostering an understanding of the coherence of the various sciences and a sense of social responsibility".
The grammar schools, formerly referred to in the old act as institutions of preparatory higher education, are no longer included in the new act, being included instead in the bill on further (secondary) education.
In the old act the universities proper and the technological universities, schools of economics etc., were dealt with separately. The new act contains a general section which applies to all institutions of higher education, and in which the existing public and recognized private institutions are summarized as: the State Universities at Leyden, Groningen and Utrecht, the State Technological Universities at Delft and Eindhoven, the Municipal University of Amsterdam, the private Universities at Amsterdam and Nymegen and the private Schools of Economics at Rotterdam and Tilburg. Only the Agricultural University at Wageningen, a State institution which falls under the jurisdiction of the Ministry of Agriculture and not under that of the Ministry of Education, will be dealt with in a separate act.
The distinction between public and private academic education is mentioned explicitly in the new act. It is expressly stated that the regulations relating to both shall be seen as binding upon the public institutions and as the conditions for the granting of a subsidy to the private universities.
An important new feature is the founding of an *Academic Council,* which will function as a connecting link between the various institutions of academic education and between them and society as a whole. The old act did not provide for any official body of this kind which could foster co-operation among the universities. A Technical Higher Education Council had, it is true, been set up in 1956 and an unofficial Inter-University Contact Body had been paying attention to co-operation among the universities for some years. The Netherlands Universities Foundation for International Co-operation (NUFFIC) had also taken charge of a number of international matters – and is still doing so.
The *Academic Council* will give advice to the minister, on request or on its own initiative, and also to the universities and other institutions of higher education; it will also submit a report to the Crown every four years on the progress of higher education. Each of the eleven institutions of higher education has two representatives on the Council, one appointed by the Board of Curators and one by the Senate, while the Crown itself can appoint its own members up to a maximum of ten.
The Council its competent to set up "sections" for given departments of education, to foster regular contact between professional colleagues, and *advisory committees,* including in any case one on scientific research.
The Council for Higher Technical Education already in existence will become one of these sub-committees of the new Academic Council. An Executive Council of nine members has been charged with the task of making the necessary preparations for the Academic Council's work and for putting its resolutions into force.
According to the terms of the old act, each of the State universities was obliged to

have all five of the "classical faculties". These comprise: theology, law, medicine, mathematics and natural science, and the arts (letters and philosophy). The private universities were required to have at least three of these. In the new act, eight faculties are mentioned : theology, law, medicine, mathematics and natural science, letters, economic science, social science and veterinary science. The act lays down in addition that a university should have at least three of these, one of which must be medicine or mathematics and natural science. The Academic Statute will lay down the regulations for a Central Inter-faculty, a new institution, which will include philosophy for certain, and in addition a number of courses in which various faculties will converge. Other "inter-faculties" and "sub-faculties" may be instituted. As regards the Technological Universities, their departments were mentioned by name in the 1956 Act. Under the new Act each Technological University will be required to have departments of general science, mechanical engineering, electro-technics and chemical technology.

An entirely new departure is that the State institutions of higher education are now competent to introduce new subjects, by way of experiment, in a faculty or department which will not be subsumed for the time being in the Academic Statute. The special university institutions retain the right to include courses in a faculty which by nature do not fall under the Academic Statute.

The regulations governing doctorates were formerly separate for the State Universities, the Technological Universities, the Municipal University of Amsterdam and the private universities etc. They have now been included in a single section of the act to cover all these institutions.

The fundamental principle of unity as regards the doctor's degree obtainable in each faculty has been maintained. This means that one can obtain a doctor's degree in law, but that no separate degree will exist in civil law or administrative law, for example. The doctorates correspond with the faculties, with the exception of the doctor's degree in philosophy, since this latter subject now falls under the Central Inter-faculty. At the Technological Universities a doctorate in the technical sciences can be obtained, at the Schools of Economics a doctorate in the economic sciences. There is, of course, a doctor's degree in agricultural science at the Agricultural University, but, as has been explained, this does not fall under the jurisdiction of the new act.

Admission to academic examinations (in Holland the equivalent of admission to the university) on the basis of a final, leaving certificate at the advanced secondary (preparatory higher) level has been maintained in principle, while the regulation has in some respects been made rather suppler. It will now be possible to take the academic examinations of a faculty (or in the case of the technological universities, a department) other than that to which one is entitled on the basis of the school leaving certificate, after a preliminary examination in those subjects not covered, or inadequately covered, by the final secondary school examinations.

The admission of foreigners to the university examinations and to the degree of doctor, the rules for which were formerly laid down in a number of articles of the old act and a number of Orders in Council, will now be regulated by the Academic Statute. It is not likely that any change will be made in the procedure adopted. The foundations have been laid in the new act for a bachelor's degree examination, intended as the final examination of an abbreviated course of study, such as already exists at the Netherlands School of Economics at Rotterdam and as will most likely be introduced, by way of experiment, at the Technological University at Eindhoven as well.

The new act declares that the State Universities and the Technological Universities enjoy the status of corporations (bodies corporate), a status already conferred on the latter by the act of 1956.

Under the old act the State Universities were financed entirely by the State. From now on they will acquire their own income, on the same footing as the State Technological Universities. This will consist of: an annual contribution from public funds; registration, lecture and examination fees; gifts, bequests and legacies; income from services rendered; income from capital, and other income. The annual contribution from the national treasury will make up the greater part of their income. The amount will be determined by the minister and included in the national budget, on the basis of estimates drawn up by the university curators and approved (temporarily) by the minister.

As regards the Municipal University of Amsterdam, 95 % of the contribution will come from the State and 5 % from the municipality. Previously, the cost had been borne by the municipality of Amsterdam, while the State had agreed to meet 90 % of the cost of investment during 1959 and 1960.

As regards the private Universities, the State has so far met 90 % of the overheads and the running costs, though these universities could never receive more than the equivalent of 60 % of the average expenditure of the sister faculties in the State universities to cover the latter item, the running costs. At the same time the State met 70 % of the overheads and running costs of the Schools of Economics. From now on, however, all recognized private institutions of academic education will receive a contribution representing 95 % of the net costs, provided these do not exceed what is generally regarded as the norm in this country for university equipment. Further costs, provided they fit into the total provisions made for science and academic education, will be subsidised in the same proportion.

The principle underlying the new arrangement is the desire to afford the private universities the same chances of development as the State universities, since they perform part of the nation's task in this field. It is a consequence of what is known as the "pacification of education" in the Netherlands, i.e. the financial equality of public and private elementary education laid down in the constitution of 1917 and in the Elementary Education Act of 1920, and later applied, to a very large degree, to further (secondary) education.

No separate place was accorded to academic staff in the old act. The new act defines the "academic corps": full-time professors, full-time lecturers, assistant lecturers, librarians, academic assistants. This had already been done for the Technological Universities in the 1956 Act. Professors, lecturers, librarians and the directors of academic hospitals (hospitals associated with universities) are appointed by the Crown on the basis of a recommendation made by the curators, after consultation with the Rector and Assessors and after the advice of the faculty or department concerned has been obtained. The academic assistants and other personnel are appointed by the Curators.

In the old act the provisions relating to the students were scattered over many articles. In the new act they have been brought together in a single section. The regulations bearing on the grant of bursaries have been generally broadened. In addition, the minister is competent to grant special bursaries to students who show exceptional academic ability.

The universities and other seats of higher education are administered by Curators and a Senate, assisted by faculties or departments, as the case may be. Each university etc., draws up its own regulations, which require the Crown's approval. As regards the Technological Universities, the Act of 1956 laid down that the central administration should endeavour to achieve closer co-operation between, and a closer integration of, the various organs of the university. This idea has been further elaborated in the new act. For instance, the regulations are drawn up by the Curators, in agreement with the Senate, while the faculties (or departments) must be consulted. The regulations may lay down that the promotion of the university's interests should be assigned to a joint assembly consisting of the Curators and the Rector and Assessors. In addition, the Rector Magnificus and one or more members of the Senate may attend the meetings of the Board of Curators, while, conversely, one or more of the Curators and the Secretary of the university or other seat of academic education may attend meetings of the Board of Rector and Assessors. Consultation on day-to-day affairs is the task of a board consisting of a Curator appointed by the Board of Curators and the Rector Magnificus.

The position of the Curators has been altered in the sense that they now exercise certain powers *sue jure* and no longer by delegation. It is their task to take charge of accommodation and to administer the university's property and finances. They are competent to make arrangements legally binding upon the university with the exception of a number of important matters which require the minister's approval.

The Senate consists, as it did in the past, of the full-time professors, with the associate professors and professors emeriti acting in an advisory capacity. The Senate promotes the general interests of teaching and the practice of science. Its chairman, the Rector Magnificus, is appointed for a maximum period of four years, which lays the legislative foundations for rectorships lasting more than one year.

The old act did not contain provisions regarding the organization of the university faculties, but the new act accords them (and the departments at the technological universities) a significant place in the university's administration. They will now be concerned with, or consulted on, many important matters, such as plans for development, financial systems, the provision of teaching staff, buildings, etc. They will also have their own budget. The chairman of the faculty is elected for a four-year period. The faculties and departments take charge of teaching and the practice of science in their particular field and the holding of examinations.

The University of Amsterdam has also been made a body corporate. The regulations concerning its administration and organization have also been laid down by municipal order. The Curators are responsible to the minister as regards observance of the Act and to the municipality of Amsterdam as regards organization. It differs from the State universities in that the curators appoint the professors and lecturers, subject, however, to the Crown's approval. From now on the appointment of professors and lecturers at the private universities will not require the approval of the Crown.

CHRONICLE

UNIVERSITY NEWS

State University at Leyden

First Centenary of the Leyden Observatory

The first centenary was celebrated on May 12, 1961 of the Observatory of Leyden University. A faithful architectural copy of the then famous Leningrad Observatory, the building was opened in 1861 and occupied by Prof. Kaiser, who started out with one assistant and one employee. At present the Leyden Observatory functions under the direction of Prof. J. H. Oort, assisted by a regular scientific staff of 25. Data are worked out in Leyden which are collected by the radio telescope at Dwingelo – in eastern Holland – and by the overseas branch of the Leyden Observatory in the Union of South Africa. The latter station on the Southern Hemisphere is of considerable importance since almost 90 per cent. of all astronomical observation posts in the world are located north of the equator.

State University at Utrecht

65th Lustrum

The 325th anniversary of the State University at Utrecht was festively celebrated in April 1961. Twenty per cent. of all university students in the Netherlands are enrolled at Utrecht. Spread out over the city at present, the university is to have its own campus in due course on the outskirts of the town. A symbolic start to the work on the new buildings was made during the celebrations by the Secretary General of the Ministry of Education, Arts and Sciences when he drove the first pile into the ground: the nature of the soil in large parts of the Netherlands necessitates the founding of buildings on long piles driven into the ground. The new campus, to cover 850 acres of ground with 75 acres reserved for sports and recreational activities, will take several years to complete. The B. faculties will be the first to find accommodation on the precincts.

A high light of the lustrum celebrations was the award of six honorary doctorates. Of the scientists thus distinguished on this occasion the only Dutchman was Dr. G. P. M. Knuvelder of Eindhoven. Author of a four-part manual on the History of Netherlands Literature, a work that has gained renown in this country in a very short time, he received an honorary doctorate of letters and philosophy.

An honorary doctorate in the faculty of theology was conferred on Prof. André Parrot, archeologist and professor at the Ecole du Louvre in Paris. Since 1926 Prof. Parrot has been taking part in important excavations. He led several expeditions, including one at Mari in 1933, where in the course of a number of years he laid bare a large town in the Syrian desert on the Central Euphrates.

An honorary doctorate of law was conferred on Prof. Jean Carbonnier, who currently teaches judicial sociology at the Faculté de Droit in Paris. He is considered one of France's foremost jurists. His writings include a book on civil law. Prof. Carbonnier gave a series of lectures at Utrecht University some time ago which were greatly appreciated.

An honorary doctorate in the faculty of medicine was conferred on Prof. Frédéric Bremer, professor at the Free University of Brussels. For many years Prof. Bremer has been engrossed in the study of the physiology of the central and peripheral nervous system. He has made important contributions to endocrinology, neurology and pharmacology. Several researches made in Utrecht correspond directly to those of the Brussels scientist.

An honorary doctorate of mathematics and physics was conferred on Dr. Albrecht Unsöld, professor at the Christian-Albrechts University of Kiel. Prof. Unsöld has been working specifically on the application of physical views in the interpretation of astrophysical observations. He has been concentrating on the so-called Frauenhofer lines, has succeeded in giving a quantitative analysis of the composition of the sun, and has published the manual "Physik der Sternatmosphären."

An honorary doctorate of letters and philosophy was conferred on Dr. H. van Werveke, professor at the State University of Ghent. This Belgian historian is doing pioneering work for the Netherlands language area in the field of historical demography. He was the initiator and a member of the editorial staff of the twelve-volume General History of the Netherlands. This work, to which he himself contributed a number of important chapters, was produced in co-operation between historians of South and North and was completed in 1958.

RESEARCH

Current Projects of the Institute for Perception Research

The Institute for Perception Research of the Technological University at Eindhoven (see Vol. II, No. 4 of this Bulletin, pages 22–23), concerns itself with pure and applied scientific research in the field of human perception. The term "perception" is to be taken to cover the subjective phenomena encountered in sensory observation (e.g. seeing and hearing), in the assimilation of these by the human brain (e.g. recognition, memory, learning, forgetting, deciding), and the ultimate direction of human action (e.g. sorting, arranging, counting, assembling).

It appeared that the Natural Science Laboratory of the Philips Lamp Company and the Technological University at Eindhoven were interested in the idea of joint activity in this field of work. The connecting link in this respect is the fact that the ultimate assessment of a technical product's or instrument's worth is often determined not by its technical merits alone, but by human factors, by man himself, whom technics are meant to serve.

As far as the industry is concerned, these subjective factors are of great importance in designing both technical products and the tools and working methods it employs in the factory. As far as the Technological University is concerned, it is highly important that its students should be fully aware of the fact that in many projects the technical and human factors must be given equal consideration. By developing this activity on a basis of co-operation, one enjoys the not to be underestimated advantage of having a stream of important and interesting problems coming in from the side of industry, the treatment of which will gain in academic depth by virtue of the Technological University's participation in the work.

The general theme of research lies in the field of the human informative cycle: observation, assimilation of observation and action.

In the field of *seeing* work is going on, inter alia, on the adaptive phenomena in the retina, on the measuring of infinitesimal differences in the time during which the perception of light occurs, and on the degree of pupil contraction to light of various wave lengths. These investigations have already led to interesting results.

In the field of *hearing* the central theme is the demand for the physical correlation of pitch perception. It is becoming increasingly probable that this rests on a time measurement. Efforts towards a further unraveling are made by the measuring of meta-periodical sounds and extremely short time blasts. In the field of *phonetics* the central theme is the demand for the physical correlation of phonemes (elementary speech sounds). It has become apparent that the time pattern plays a far more important role than had generally been assumed. The correctness of this supposition was confirmed by the production of remarkably natural synthetic speech sounds in accordance with precisely directed time patterns.

Attention is paid, furthermore, to the systematics of linguistics in conjunction with those of the science of technical communication, inquiries that are made in co-operation with practitioners of philosophy at the Eindhoven Technological University.

In the field of *human assimilation of information* different kinds of researches are carried out on the recognition of patterns, ciphers, letters, etc., and on the way in which these activities can be expressed in terms of a perceptive charge, taxes and taxability.

In the field of *human action* an extensive investigation was made, inter alia, with respect to the legalities in the speed and precision of assembling actions, and this has yielded important results. In connection herewith a study is in progress on the motory mechanism of the human arm.

An elaborate electronic apparatus, the DONDERS, has been developed and constructed for measuring human reactions according to time and quality. The first simultaneous measurements of a number of test cases as well as the first automatic processing of the results attained, have now been completed.

In the field of *instrumentation* many new electronic and switch technical instruments are needed and these are being produced partly by a group of University technicians and partly by the Natural Science Laboratory of the Philips Company. On a limited scale the Institute's technical potentialities are made available for the adjustment of the handicapped. To mention two examples, an automatic manipulatory typewriter for Braille writing is under construction, and expedients are being developed which will enable spastics to operate a typewriter more rapidly and with fewer mistakes.

Development of a "Thinking Machine"

A research contract was recently concluded between the European Community for Atomic Energy (Euratom) and the University of Amsterdam. On the grounds of this contract attention will be paid in coming years to the development of a so-called "thinking machine" at the University's Institute for Basic Research. The idea of bringing a machine of this nature to development was stimulated on the one hand by the recent progress in the construction and operation of electronic computers and on the other by the formulation of simplified "natural" methods of logical deduction. Methods such as these have been developed and studied both by Prof. E. W. Beth, Director of the Institute and by various logicians in Germany, America and Sweden.

Furthermore, the idea of a "thinking machine" has given fresh actuality to the very old problem of mathematical heuristics to facilitate the frequently exhausting and time-consuming search for a solution to a mathematical problem. The researches to be carried out in Amsterdam, work on which has meanwhile started, are also connected with thought psychology. Not only can thought-psychological insight give a certain direction to investigations ultimately leading to the construction of a "thinking machine," but the study of this machine's potential will also help to elucidate all kinds of problems of thought psychology.

The contract forms part of a comprehensive research programme drawn up by Euratom for the benfit of scientific workers to facilitate, by means of automatic processes specifically in the field of nuclear physics and nuclear technics, the finding of scientific data important to them, and to enable them to keep constantly up-to-date on the world's latest scientific achievements. The scientific publications appearing in many languages, even in the relatively restricted domain of nuclear sciences, are so numerous that it is becoming virtually impossible, even for colleagues, to keep up with and find their way about in them without new expedients. And the flood of literature is still increasing. This has led Euratom to draw up a research programme for the development and construction of an (electronic) machine capable of independently reading scientific publications, making excerpts, sorting them systematically and rendering them immediately into the language desired.

Part of this research programme is carried out by a group of experts working in Euratom's communal research centre, and part is executed on a contractual basis by a number of scientific institutes in the six Euratom countries, including the Institute for Basic Research and Philosophy of the Exact Sciences of Amsterdam University, under the direction of Prof. Beth.

Subsidies Z.W.O.

The Netherlands Organization for Pure Scientific Research (Z.W.O.) has granted subsidies to a value of 10,174,000 guilders for the year 1961. A total of 154 subsidies are allocated for researches in various scientific fields, the largest, constituting a sum of seven million guilders, going to the Foundation for Fundamental Research on Matter (F.O.M.).[2])

Of the remainder 750,000 guilders have been set aside for the spiritual sciences, 225,000 guilders for medical researches and approximately 290,000 guilders for biological researches.

Other subsidies will go to the exact sciences such as geology, astronomy, natural science and chemistry.

The Mathematical Centre at Amsterdam received circa 400,000 guilders, as did the Foundation Radio Radiation of Sun and Milky Way. More than 450,000 guilders have been granted to the Foundation Chemical Research in the Netherlands (S.O.N.).

The amount of 10,174,000 guilders does not include the stipends and travel scholarships Z.W.O. distributes on a large scale. To this effect approximately a million guilders have been set aside. It does, however, include a sum of 220,000 guilders to be used for the issue of 22 scientific publications.

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[1] See Vol. I, No. 2 of this Bulletin, pages 7 - 9

[2] See Vol. II, No. 4 of this Bulletin, pages 16 - 30

INTERNATIONAL COURSES

Six-month International Course on Small-scale Industries of the Research Institute for Management Science (R.v.B.)

The R.V.B.'s Eighth International Course closed on April 28, 1961 in the auditorium of the Technological University at Delft. These courses, which were initiated in 1955, have been organized twice a year since 1959, the summer course running from May to October and the winter course from November to April. Up to the present, 85 students from thirty different countries have participated in these international courses. The eighth course was attended by 11 students, three of which came from Jordan, three from Malaya, two from

Pakistan and one each from Brazil, Portugal and the United Arab Republic.

After taking part in the Course's three-month General Programme, consisting of lectures, case studies and practical exercises either at the R.V.B. or in Dutch small-scale industrial enterprises, participants were given specific assignments in Dutch industrial firms (Special Programme lasting three months). During this practical work they were regularly coached by expert staff members of the R.V.B.

The assignments executed by the participants during the Special Programme included, inter alia, studies on:

the distribution system of a dairy enterprise;
co-operatives in the field of the dairy industry;
the balancing of the capacity of furnaces and presses in a metal forge;
the establishment of an industrial community;
the layout of a factory of kitchen utensils;
the time utilization in a subcontracting metal industry;
the optimum speed of work in progress in a metal industry;
the costing system in a machine factory;
the analysis of time utilization in a crane factory;
the organization and personnel management in a governmental workshop;
some of the characteristics of industrial management in the Netherlands.

Participants drew up written reports on these assignments which had to be defended by them before an evaluation committee of outside experts, coaching R.V.B. staff members and managers of the respective industrial enterprises.

The reports submitted by the participants proved that they had made a thorough study of their various subjects and were very well received by the managers of the industries in which the practical assignments had been carried through.

As in previous courses it was again quite remarkable to see how thoroughly the students had familiarized themselves with the problems of the respective industries and how pleasant contacts had been with managers, staff members and workers of such industries despite the language barrier. This, however, even in contacts with workers of the enterprises, presented no unsurmountable obstacles.

It may be safely stated that the experience gained by participants during the General and Special Programme will prove of considerable benefit to them and to their respective home countries on the road towards industrial development.

Bouwcentrum (Building Centre)

Third International Course on Building

On Friday April 28, 1961 ten participants in the Third International Course on Building were presented with a diploma by the Course Chairman, whilst one participant received a statement to the effect that he had followed the Course with dedication.

And so another International Course on Building, organized by the Bouwcentrum (Building Centre) in co-operation with the Central Organization for Applied Scientific Research TNO and the International Federation for Housing and Planning had come to an end.

During the past six months participants from: Formosa, Greece, Haïti, India, Liberia, Pakistan, Peru and the United Arab Republic concentrated on the study of subjects pertaining to building.

These courses are based on the idea that all leading officials involved in building should be aware of the principal problems that arise in the various phases of building. This idea led to four sections of study, i.e.:

General preparations for building
– physical and economic planning –
Preparation of the design
– functional studies –
Integration of the results of technical research – technical and physical aspects of building –
Preparation for the execution and management – planning of the execution and management –

Following the theoretical part of the course, which was the same for all participants and consisted of introductions, discussions and directed excursions, each member was given the opportunity of carrying out a practical part of the course. To this effect a special programme had been drawn up for each participant separately with a view to the specialization he had chosen.

For example, an architect from the United Arab Republic worked with a firm of architects and helped to design an urban project in the northern part of the Netherlands. An architect from India stayed for a time at Eindhoven where he assisted in designing the university buildings now under construction. A contractor from India acquainted himself in particular with the problems – and the solutions thereto – arising specifically during the execution of a project on the building site. An engineer from

Pakistan spent some time in a number of contractors' firms in order to learn more about the works in concrete.

By studying selected documentation, each participant was able to supplement the knowledge he had acquired in practice according to his personal requirements. Although everybody went their own way during the practical part of the course, contact was maintained throughout by means of participating in joint excursions and attending meetings in the Building Centre at Rotterdam. Furthermore, course members both gave and attended lectures, including one on "West European Thinking" organized by NUFFIC and the International School for Philosophy.

A highlight of the joint undertakings was the broadcast for the station Radio Nederland Wereldomroep of a lecture by Ir. J. van Ettinger, Director of the Building Centre, on the subject: "Towards a Habitable World," which is also the title of a book he wrote in 1960. Course members took an active part in this broadcast by posing and answering questions and by making observations. Remarkable during this Third Course was the considerable solidarity among participants. Coming from various countries with their own culture, and architects or engineers by profession, right away these differences in no way hampered the excellent understanding between them. It goes without saying that the studies benefitted greatly from this mutual understanding owing to the resultant exchange of knowledge and experiences. It is a satisfying thought that also because of this Third Course architects and engineers will return home enriched after a six-month stay in the Netherlands. Enriched not only by the knowledge and experience gained, but also by the conscious awareness that frontiers can be crossed, and in certain cases even disappear altogether.

By the joint efforts of all those involved in building the world housing problem will one day be solved. A condition is, however, that those involved understand each other. It is hoped that this Course also contributed towards this understanding.

INTERNATIONAL SCIENTIFIC MEETINGS

3rd Congress of the International Comparative Literature Association

The third Congress of the International Comparative Literature Association will be held from August 21–26, 1961 at the University of Utrecht, The Netherlands.

The main theme of the Congress will be: the literatures of non-universal languages. The secondary theme will deal with the definition of some literary terms and problems of methodology associated with the preparation of a dictionary of literary terminology. The two official languages of the congress will be French and English.

Information: Secretariat of the 3rd I.C.L.A. Congress, 16, Lange Voorhout, The Hague.

International Euromarket Seminar

From September 6 to 9, 1961, an International Euromarket Seminar will be held at Delft, organized by the Research Institute for Management Science.

Information: Research Institute for Management Science, 76, Nieuwe Laan, Delft.

Symposium on "Energy Metabolism of Farm Animals"

The European Association for Animal Production will be organizing a symposium on "Energy Metabolism of Farm Animals," to be held from September 11 to 15, 1961, at Wageningen. Participants will be invited by various institutes working in this field of science.

Information: International Agicultural Centre, 1, Generaal Foulkesweg, Wageningen.

European Geriatric Congress

A European Geriatric Congress will be held at The Hague from September 13 to 16, 1961, organized by the International Association of Gerontology.

Information: N.V. Philips-Duphar, Afdeling Verbruiksontwikkeling, Apollolaan 151, Amsterdam.

International Seminar on "The Economics of Materials Handling"

An international seminar on "The Economics of Materials Handling" will be organized by the Research Institute for Management Science from October 2 to 5, 1961, at Delft.

Information: Research Institute for Management Science, 76, Nieuwe Laan, Delft.

International Seminar "Scientific and Technical Personnel"

The Research Institute for Management Science will be organizing an international seminar on "Scientific and Technical Personnel" at Delft, from November 21 to 25, 1961.

Information: Research Institute for Management Science, 76, Nieuwe Laan, Delft.

MISCELLANEOUS

The Netherlands Buys a Dead Sea Scroll

The Royal Netherlands Academy of Sciences has acquired the right to purchase a Dead Sea scroll which will remain in Jordan, however, as the Jordan Government does not permit the scrolls to leave the country. After the text is studied and published the valuable document will be relinquished to the Jerusalem Museum as a gift from the Netherlands.

The scroll in question is the Aramaen "targum" of the Book of Job, and was found in "grotto eleven" near Qumram. A targum is a paraphrase and exegesis of a book of the bible or of a number of chapters thereof.

The paraphrase concerned is said to date from the beginning of our era or thereabouts. It may possibly provide a decisive answer regarding parts of the Book of Job the interpretation of which is made difficult by the mutilations of the present text. For this reason a study of the Job targum may prove highly important for the knowledge of the original text.

The price of the scroll has not been disclosed. Its purchase was made possible by a subsidy of the Ministry of Education, Arts and Sciences. The Netherlands Organization for Pure Scientific Research (Z.W.O.), equally on behalf of the Academy of Sciences, has been negotiating in Jordan with respect to the exclusive rights. In this connection it held consultations with the board of the Archeological Museum in Jerusalem (where the Dead Sea scrolls are kept), with the Jordan Minister of Education and with the head of the Jordan Antiquities Service.

It is not yet known who are to study the scroll. The Royal Netherlands Academy of Sciences will designate a number of experts who will make a scientific study to take place partly in Jerusalem and partly in the Netherlands with the aid of photographic copies.

Industrialisation: More Heat and Sometimes a Little More Rain

The continual and even increasingly rapid rise in temperature over almost the entire terrestial globe is probably one of the results of industrialisation. Moreover, concentrations of certain industrial settlements frequently result in an increase in the volume of precipitation. These were two of the theorems propounded by Prof. H. P. Berlage of Utrecht University at the annual meeting of the Union of Scientific Research Workers, which was held in March 1961.

There is, the professor said, a distinct connection between the volume of carbonic acid gas in the air and the temperature of the earth. About a century ago the percentage of carbonic acid gas amounted to 0,03; now it is 10 per cent. higher, and that specifically as a result of industrialisation.

This doesn't appear to be much, but in realizing that a doubling of the volume of carbonic acid gas in the air would cause a 3 to 4 degree rise in temperature all over the earth, some impression is gained what even three thousandths of a per cent. mean to the climate. A difference of three to four degrees, for example, already greatly affects the size of glaciers and polar peaks, and in consequence the ocean levels, the temperature of gulfstreams, etc. The effect of carbonic acid gas in the air is approximately comparable to the effect of glass on a hothouse. It lets through light rays (rays of a shorter wave length) but obstructs rays reflected by the earth which then have a longer wave length and lie more nearly in the heat area.

Food Cheaper

According to Prof. Berlage the change in the volume of carbonic acid gas in the air is also responsible for the occurrence of ice ages. When more and more carbonic acid disappears, absorbed by the oceans, the temperature drops. There is more ice and therefore less water. Smaller oceans are capable of retaining less carbonic acid than former larger ones; more carbonic acid comes into the air and the temperature starts to rise again. This causes more ice to melt, the oceans are able to absorb more carbonic acid gas, the percentage of carbonic acid gas in the air decreases, etc.

The possible consequences of an increase in the volume of carbonic acid gas in the air must therefore be regarded with the utmost care, Prof. Berlage said. A few possible practical consequences were advanced at the meeting which could prove to be of truly unprecedented significance.

A few degrees' rise in temperature in summer could cause an extremely rapid increase in agricultural and horticultural production. Ten degrees' rise in temperature results in a doubling or even tripling of the rate of speed of biological processes.

Moreover, as is known, plants consume carbonic acid gas. A higher concentration of carbonic acid gas in the air would also accelerate the process of growth, make the harvests bigger and therefore the food cheaper.

On the other hand even a relatively small rise in temperature means an important contraction in the size of glaciers. This definitely has highly detrimental effects on the water in mixed rivers, such as the Rhine. Even today the salt content of the Rhine is showing a rapid increase, a factor that is not only detrimental to drinking water but even more to agriculture and especially horticulture. The problems of the Westland[1]) in this connection are well enough known. It is impossible to foresee what the consequences will be.

Rain Making

Besides influencing the temperature almost all over the world – as has been clearly demonstrated in hydrogen bomb tests gases in high air strata spread over almost the whole of the earth within a few weeks – industry also has local effects on the weather.

Precipitation occurs when air is forced to rise suddenly. Mountain slopes as well as the region directly behind the dunes have far more precipitation than the sea or areas in the interior. Above precincts such as the oil refineries near Rotterdam where an enormous quantity of heat together with "condensation nuclei" are sent up into the air, a typical formation of rain clouds is regularly to be seen, also on otherwise clear days.

Meteorologists have been aware of this phenomenon for many years and would very much like to make use of it in order to create rain in places where they want it. They are handicapped in this connection, however, in that regions above which the air is particularly dry, are excluded right away. In fact, where there is no water no rain can fall. Thus far many experiments have been made, for example, by scattering ice crystals on clouds. This did indeed cause some rain, but up to now this system does not appear to be economically justified since the rain does not compensate the costs involved in its production. What could prove economically justified, for example, is to attack hail showers in this way. Hail occurs with a rapid stowage of clouds to high air strata where it freezes. If attempts to force precipitation are successful before these high air strata are reached, rain is obtained which in general causes far less damage.

Nuclear Energy

It is not quite clear what nuclear energy can mean to rain making. That the propulsion effected by the nuclear explosion, combined with ions in the air which could serve as condensation nuclei, could cause a considerable amount of rain is not unthinkable.

Also the introduction of very fine dust screens at a great height in a manner comparable to that used by the Americans in their Argus project may influence the climate. The great volcanic eruptions of history similarly had such influence. The dust that was flung into the high air strata during the eruption of the Krakatau in 1883, for many years reduced the normal sun radiation by approximately 10 per cent. in large areas of the world.

Prof. Berlage thought there were more prospects in using nuclear energy for the evaporation of large quantities of water from rivers as the Congo, the Nile and the Niger. In view of the wind directions prevailing in these regions, a large part of the Sahara would thus come to lie beneath air of greater moisture which in turn would provide these deserts with a better climate. He believed that technically this idea could be realized.

Eventually the closing of straits can also have a tremendous influence. If, for example, in concurrence with existing Russian plans, the Bering Strait were to be closed off, it is probable that in a thousand or two thousand years to come the whole of N. E. Asia would have a much better climate than it has now.

There are also a number of short term possibilities. For example, the Russians have closed off the strait between the island of Sachalin and Siberia and since then the port of Vladisvostok is free of ice for a much longer annual period than was previously the case.

Prof. Berlage ended by saying that such actions should be carried out with utmost care since they might very easily involve consequences which had not been foreseen.

Death of Prof. W. J. M. van Eysinga

The work of Prof. W. J. M. van Eysinga, who died in Leyden in January 1961 at the age of 83, spans more than half a century of science and practice of international law. It was half a century of stormy development and overwhelming collapse in that sector of the law.

Yet all these years Van Eysinga, the professor, the international judge, the author, remained an indefatigable fighter, constantly explaining, repeating and presenting arguments in a new form and with new reasoning.

It is sometimes said to-day that the Netherlands gains nothing in the world by being the "land of Grotius." In the light of this almost cynical way of thinking "the land of Grotius" is in danger of losing its character of name of honour. But in the light of Van Eysinga's work, precisely also his practical work, "the land of Grotius" is something very real. Van Eysinga was no international Utopian. He was a worker of deep conviction and Friesian tenacity. Few knew Grotius as he did. Perhaps that was what made him in everything he wrote and did such a passionate representative of the "land of Grotius." His position was strong because he was not only a theorist but also a man of practice in the international administration of law – as judge of the Permanent International Court of Justice, and as man of practice in international ruling - as Commissary for Rhine Shipping.

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[1] The main horticultural region in the Province of South Holland.

The Rhine Shipping system was, in fact, one of Van Eysinga's specialisms, a piece of international regulation about which he never tired of publishing, invariably combative where nationally directed forces came into conflict with the regulation.

Upon his appointment in 1931 as international judge in The Hague, he was forced to relinquish his professorship. Van Eysinga the professor had been teaching at his beloved Leyden University since 1912 at the time, and before that, since 1908 – two years after his graduation in political sciences – at Groningen University. Moreover, from 1913 to 1919 he had been part-time professor at the Netherlands School of Economics in Rotterdam, later becoming curator there, a post he held until 1954.

The Freedom from Hunger Campaign and the Food and Agriculture Organization of the United Nations

In February 1961, on the occasion of his inauguration in the State University at Groningen as professor in the knowledge of international organizations, in particular in connection with the agrarian and food policy, Dr. A. Vondeling delivered an address, a summary of which follows below.

Speaker took as his point of departure the two most recent resolutions of the United Nations and the Food and Agriculture Organization on the Freedom from Hunger Campaign and the disposal of surpluses, resolutions which he described as making a resolute and encouraging impression.

Certain countries have surpluses, others shortages: the United Nations and specifically the Food and Agriculture Organization are going to tackle this literally perilous problem together and as one. The language of these resolutions speaks for itself. It is, in fact, the common language of consumers, doctors and farmers, without distinction as to race or creed. Can this language make good what it suggests? Can the F.A.O. bring the solution so many have been looking forward to for so long? Does this body, eldest in a row of specialized organizations, possess the knowledge, the competency, the means and the experience to this effect? To answer this question an attempt should be made first to indicate the outlines of the world's food and agricultural question, and next to examine the scope of the F.A.O. and review what has thus far been done and with what results.

Speaker holds aloof from the battle of the doctors regarding the seriousness of the food situation, but ascertains that the highest priority is given to food supply and agriculture in many large countries, as, for example, in India's new five year plan. As far as the supply is concerned, he shares Colin Clark's optimistic view that the earth is capable of feeding its inhabitants, also if there should be a further sharp rise in population.

It is obvious, however, that in view of the big capital transfers involved, high demands will be placed on policy, both on the giving and the receiving end. Speaker believes that the problem of bringing a reasonable degree of harmony between the demand for and the supply of food is not an unsolvable one considered from the viewpoint of the world as a unit. It means that the United Nations Food and Agriculture Organization is faced with a task that is certainly not unworkable in principle. Despite the drawbacks attaching to a quantitative weighing of the working results of an international organization such as the F.A.O., speaker yet wished to make a modest attempt in this direction. He confined himself to three activities, namely, those of increasing the productivity, stabilizing the markets and disposing of the surpluses. With respect to the latter Dr. Vondeling asserted that experience in countries as Japan and India has shown, that, provided a number of factors are taken into account, excellent use may be made of food surpluses, both to improve in some measure the food situation in underdeveloped countries and to contribute to the economic development of such countries. In the knowledge that various highly developed countries possess or will shortly possess large surpluses of agricultural products, there is a considerable chance that by using these surpluses the total aid will become greater than is otherwise to be expected.

The F.A.O. has not been altogether succesful because its activities have been small both in number and force. Unfortunately the expectations aroused by the decisions taken in 1943 and 1945 and in the first years of the F.A.O.'s existence – expectations that are revived in reading the documents of that time – were not fulfilled. Why is this and how can the F.A.O. attain its goal more fully? First and foremost its budget must be substantially increased. The lopsidedness of the present position is demonstrated by the fact that in recent years the Netherlands Minister of Agriculture and Fisheries had authority to spend 15 to 20 times as much as the Director General of the Food and Agriculture Organization. F.A.O.'s activities would also be greatly extended if the countries rendering assistance would allow part of their own programmes to be carried out directly by this world organization. A third way of enabling the F.A.O. to fully effect its purpose is to adopt a working method such as the one followed by the O.E.E.C. in certain domains. It would be a big step forward if the different countries were regularly to submit to the F.A.O. for criticism their development plans, activities etc. in the field of agriculture and food supply.

As long as no great progress is made in the three afore-mentioned directions, there is little point in talking about changing the Statute. Any changes which would make the F.A.O. more of an independently acting body and less of a studying, advisory and (to some extent) coordinating institution would stand little chance of being accepted anyway. As soon as a beginning is made with the satisfactory utilization of the possibilities provided for under the present Statute, there is sense in considering the competencies anew.

Addressing himself in conclusion to the students, Dr. Vondeling pointed out that there is an acute shortage of economists and administrative experts in underdeveloped countries and that the various international organisations are unable to meet the demand.

Parasitologist Appointed to Royal Tropical Institute

The Royal Tropical Institute of Amsterdam announced the appointment some time ago of Dr. D. J. B. Wijers to the scientific staff of its Department of Tropical Hygiene and Geographical Pathology. Dr. Wijers (34), who obtained a cum laude doctoral degree on a thesis entitled: "Studies on the Behaviour of Trypanosomes of the Brucei Sub-group in the Mammalian Host," spent several years in tropical Africa, a.o. as Colonial Research Fellow in Northern Nigeria. In May 1960 he left for Kenya on a research fellowship of the Britisch Colonial Office, where he is making a study of leishmaniasis and filariasis.

Upon his return to the Netherlands towards the end of 1961, Dr. Wijers will take up active work in the Parasitology Section of the abovementioned Department of the Royal Tropical Institute under the direction of Prof. N. H. Swellengrebel whom, in time, he may succeed.

Modern Indian Languages and Their Literature

The Royal Tropical Institute of Amsterdam has sponsored the creation of a chair for "Modern Indian Languages and Their Literature" in the University of Amsterdam. The first to occupy this chair is Dr. K. de Vreese. Dr. de Vreese studied classical languages and Sanscrit at the University of Leyden and took his doctor's degree cum laude on a thesis entitled: "Nilamata or Teachings of Nila, Sanscrit Text with Critical Notes." In 1954 – 55 Dr. de Vreese travelled through India to study the more important Indo-Arian and Dravidian languages.

The curriculum of the course he is to teach will be mainly directed towards the practical study of languages which are in every day use in India and Pakistan at present. For India these are the Hindi, Bengali and Tamil languages and for Pakistan the Urdu and Bengali languages. Students and others who wish to prepare themselves for a career in these countries will thus be in a position to follow courses in languages in which they will have to express themselves later on.

Instruction in Spanish-American Literature

Dr. Carlos Martîn has recently been appointed lecturer in the faculty of letters of the State University at Utrecht where he will give instruction in Spanish-American literature.

Mr. Martîn, a Colombian, was born in 1914 at Bogotá. After attending the Colegio de San Bartolomé, where he passed his final examinations in 1933, he studied economics and letters at the Bogotá Universidad Javeriana. In 1947 he completed his law studies with a thesis entitled: "Introducción al Estudio de las Obligaciones Naturales," which was published in the Revista de la Universidad Nacional de Colombia (1948). Although he thus became a doctor of law, he has been interested since early youth in the study of letters and in his student days attended a great many lectures in the faculty of letters. Dr. Carlos Martîn has regularly been employed in education as tutor in Spanish-American literature. He was director of the "Departamento de Humanidades" of the Bogotá Universidad de América in 1957–1958, and the following year taught Spanish and Spanish-American literature at the Universidad de Los Andes in Bogotá. As man of letters his work includes three volumes of poetry and a collection of essays. He is a contributor to several Colombian literary magazines and has written articles on subjects as: Antonio Gómez Restrepo, Sa-

nîn Cano, Barba Job, La nueva poésia colombiana, El Vanguardismo en España y en América, Carlos Pallicer, Pablo Neruda, Nicolás Guillén, César Vallejo, Gabriela Mistral, El castellano en América, Juan Ramón Jiménez en Hispanoamérica, Robert Bazin y la literatura hispanoamericana, Joge Carrera Andrade, José Martî, Sarmiento, La poésia negra en Hispanoamérica, Guillermo Valencia, Ermilo Abreu Gómez.

As the author of several poems and essays, Carlos Martîn was the soul and driving force of "Piedra y Cielo," a well-known literary movement in his country which became famous particularly in 1939 and 1940 by the publication of seven volumes of poetry which greatly influenced Colombian literary circles. "Piedra y Cielo" aimed to bring about a poetic renewal, an idea that led to violent controversies at the time but is now almost generally accepted. The movement sought to ally itself especially with the great Juan Ramón Jiménez. Dr. Carlos Martîn's powers lie not only in the critical part of his oeuvre, but also in the creative domain. "La sombra de los dias," a collection of essays published in Bogotá in 1952, testifies to his wide reading and this not only in Spanish and Spanish-American literature.

From Electricity's Nursery Days

Exhibition in the National History of Science Museum at Leyden form June 1 to October 29, 1961

This exhibition provides a historical survey of the theory of electricity as it developed from W. Gilbert's *De Magnete* (1600) to Faraday's discovery of electro-magnetic induction in 1831.The course of electricity's development will be illustrated by means of instruments, portraits, books and prints. There will also be a number of working models specially constructed for the purpose. With these, visitors to the exhibition will be able to set a number of basic experiments in operation themselves.

The museum is open from 10 a.m. to 4 p.m. Monday to Saturday, and from 1. p.m. to 4 p.m. on Sundays.

Address: 1A, Steenstraat, Leyden. Phone: (01710) – 23084

DISSERTATIONS

Theology

CRUVELLIER, JEAN MARC ETIENNE. *L'exégèse de Romains 7 et le mouvenemt de Keswick.* The Hague, 1961.
Free (Reformed) University of Amsterdam.

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With a summary in English.
Free (Reformed) University of Amsterdam.

KISTEMAKER, SIMON. *The Psalm Citations in the Epistle to the Hebrews.* Amsterdam, 1961.
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Law

BAK, LEENDERT. *Het industriële terreingebruik inNederland. Een planologische facetstudie* (Industrial land-use in the Netherlands. A study on a facet of physical planning) The Hague, 1961.
With a summary in English.
State University at Utrecht.

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State University at Utrecht.

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Free (Reformed) University of Amsterdam.

KAMFER, JACOBUS CORNELIUS GIDEON. *Testamentsformaliteite in verskeie regstelsels.* (Testament Formalties in Different Systems of Law). Leyden, 1961.
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Medicine

COST, WILLEM STOFFER. *Kwantitatieve bepaling van de bijnierschorshormonen en hun voornaamste metabolieten in urine.* (Quantitative Determination of the Adrenal Gland Cortex Hormones and Their Principal Metabolites in Urine). Groningen, 1960.
With a summary in English.
State University at Groningen.

COUVREUR, LEONARD EUGENE. *Over prolapsus funiculi.* (Prolapse of the Umbilical Cord). Utrecht, 1961.
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State University at Utrecht.

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Technical University at Delft.

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LINT, PIETER JOHANNES ADRIANUS LEENDERT DE. *An Attempt to Analysis of the Effect of Light on Stem Elongation and Flowering in Hyoscyamus Niger L.* Wageningen, 1960.
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Agricultural University at Wageningen.

MINDERHOUD, JAN WILLEM *Grasgroei en grondwaterstand. Onderzoekingen over de betekenis van de grondwaterstand voor komkleigrasland.* (Growth of Grass and Ground-Water Level. Investigations into the importance of the ground-water level for basin-clay grassland). Wageningen, 1960.
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Agricultural University at Wageningen.

BASIC DATA ON INTERNATIONAL COURSES OFFERED IN THE NETHERLANDS[1]

(see also the "International Courses" Section in this Bulletin)

Institute of Social Studies

Information: The Rector of the Institute of Social Studies, 27 Molenstraat, The Hague. Tel. 070-630550

COURSES OFFERED:

a. Two year Course in the Social Sciences, leading to the degree of Master of Social Sciences.
REQUIREMENTS FOR ADMISSION: Advanced academic standing in one of the social sciences.
NEXT COURSE STARTING: September 1961.

b. Seven-month Course in Social Welfare Policy, leading to the diploma in Social Welfare Policy.
REQUIREMENTS FOR ADMISSION: Practical experience in social work, preferably at the teaching and public service level.
NEXT COURSE STARTING: September 1961.

b. special. Specialization in Mother and Child Welfare Policy, within the framework of the Social Welfare Policy Course. Dates and conditions: see (*b*).

c. Four-month Course in Comprehensive Planning.
REQUIREMENTS FOR ADMISSION: Graduate standing in social sciences, engineering, architecture or agriculture and broad experience in one of the various fields of planning.
NEXT COURSE STARTING: September 1961.

d. Six-month Course in Economic Planning and National Accounting, leading to the diploma in Economic Planning and National Accounting.
REQUIREMENTS FOR ADMISSION: Academic standing at graduate level in economics and/or broad experience in planning, national accounting and statistics.
NEXT COURSE STARTING: January 1962.
Closing date for applications: October 1, 1961[2].

e. Six-month Course in Public Administration leading to the diploma in Public Administration.
REQUIREMENTS FOR ADMISSION: Advanced academic status and broad experience in the public service or as a staff member in institutes of public administration.
NEXT COURSE STARTING: January 1962.
Closing date for applications: October 1961[2]

e. extended. One-year study programme leading to the degree of Master of Public Administration.
REQUIREMENTS FOR ADMISSION: Candidates for this programme must either have attended the Course mentioned under (*e*) or another Course in Public Administration, approved by the Institute, with study results rated above average.
NEXT PROGRAMME STARTING: September 1961.

a–e. previous. Four-month Orientation Course for non-English speaking students. In this course non-English (especially French-) speaking students are trained to acquire a working knowledge of the English language, in order to be able to attend one of the courses mentioned above under (*a*) to (*e*). Each course starts four month earlier than the main course.

Technological University at Delft
Netherlands Universities Foundation for International Co-operation

Information: NUFFIC, 27 Molenstraat, The Hague.

COURSE OFFERED:

International Course in Hydraulic Engineering. Three branches of study:

1. Tidal and coastal engineering;
2. Reclamation;
3. Rivers and navigation works.

The course lasts eleven months and leads to a diploma.
REQUIREMENTS FOR ADMISSION: a degree in engineering of a recognized institution of higher learning.
NEXT COURSE STARTING: October 1961.

Technological University at Delft
Netherlands Universities Foundation for International Co-operation

with the assistance of the Organization for European Economic Co-operation, and the World Health Organization.

Information: NUFFIC, 27 Molenstraat, The Hague.

COURSE OFFERED: European Course in Sanitary Engineering; dealing with the struggle with water pollution in densely populated regions.

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[1] Courses are given in English only, unless otherwise mentioned.
[2] For Indian citizens application will close one month earlier.

REQUIREMENTS FOR ADMISSION: A university degree in civil engineering or a related branch of study, and some practical experience in civil engineering.
The numeral clausus for admission has been fixed at 20 participants.
NEXT COURSE STARTING: October 1961.

Netherlands Universities Foundation for International Co-operation

Information: NUFFIC, 27 Molenstraat, The Hague.

COURSE OFFERED: 1961 NUFFIC International Summer Course in Science – "Statistical Mechanics".
REQUIREMENTS FOR ADMISSION: Graduate status in physics.
NEXT COURSE: August 1–16, 1961

Netherlands Universities Foundation for International Co-operation

Information: NUFFIC, 27 Molenstraat, The Hague.

COURSE OFFERED: "Survey of the Netherlands" – introductory courses on the Netherlands, lasting about one week.
REQUIREMENTS FOR ADMISSION usual requirements for university students.
NEXT COURSE STARTING: Courses will be given during summer months, upon request, for groups of at least 15 students.

International Training Centre for Aerial Survey

Information: The Dean of the International Training Centre for Aerial Survey, 3, Kanaalweg, Delft. Tel. 01730-21980

COURSES OFFERED:

a. Photogrammetry, including cartography, topography and theory of errors; After certain conditions have been fulfilled it is possible to obtain the I.T.C. degrees of Bachelor or Master of Science in Photogrammetric Engineering;
b. Air photography and survey navigation;
c. Photogeology;
d. Use of air photographs for soil survey and other agricultural purposes;
e. The same for forestry and other sylvicultural purposes;
f. Aerial survey and regional development (a 3 month's course).

Lectures and instructions are given in English; French classes only if there are more than 3 participants.
Courses are adapted to individual needs and may therefore vary from some months to two years. Regular photogrammetric courses take between 1 and 2 years; courses in photo-interpretation between 6 months and 1 year.

REQUIREMENTS FOR ADMISSION: Dependent upon the individual student's programme of study. For interpretation courses *c, d, e* only those applicants can be accepted who have either some university degree in the corresponding subjects or an equivalent other preliminary education and experience.

COURSES START in January and September of each year except the courses *e* and *f* which start in January only.

Research Institute for Management Science

Information: Research Institute for Management Science, 76, Nieuwe Laan, Delft.
Tel. 01730-26990
COURSE OFFERED:
International Course on Small-scale Industries. Theoretical and practical training in investigating and solving the specific management problems of small-scale industries. and in the methodology which can be applied to the establishment and promotion of new industries. Successful attendance of the course leads to a diploma.

REQUIREMENTS FOR ADMISSION: BSc or MSc or equivalent degree of a recognized university.

NEXT COURSE: November 7, 1961 until April 27, 1962.

Institute for Atomic Sciences in Agriculture (I.T.A.L.), Wageningen

Information: Dr. D. de Zeeuw, Institute for Atomic Sciences in Agriculture, 8, De Dreyen, Wageningen, Postbus 48. Tel. 08370-3118
COURSES OFFERED:
Under the auspices of the International Atomic Energy Agency (I.A.E.A.) and the Food and Agricultural Organization (F.A.O.). I.T.A.L. will organize an international course on "Radio-Isotope Techniques in Soil and Plant sciences".

REQUIREMENTS FOR ADMISSION: advanced academic status in the fields of biology or agricultural science.
The numeral clausus for admission has been fixed at 20 participants.

NEXT COURSE: September 1961

International Agricultural Centre at Wageningen

Information: Director, International Agricultural Centre, 1, Generaal Foulkesweg, Wageningen. Tel. 08370-3173

COURSES OFFERED:

Research and specialization facilities in special branches of agricultural science, after completion of which a certificate is awarded. Training is adapted to individual needs and may vary from 3 to 12 months.

REQUIREMENTS FOR ADMISSION: in general M.Sc. or equivalent degree of recognized universities or colleges.

Bouwcentrum (Building Centre)

Information: Bouwcentrum, P.O. Box 299, Rotterdam. Tel. 010-116181

COURSE OFFERED:

International Course on Building in co-operation with the central organization for Applied Scientific Research in the Netherlands, T.N.O., and the International Federation of Housing and Planning. The Course is on the graduate level and lasts six months. Its object is to present a systematic basis for the treatment of the problems encountered in the building industry and to suggest a number of practical methods for tackling these problems. By attending lectures, taking part in discussions and excursions, as well as practical work, the participants gain knowledge and experience. Architects – working as designer or as builder – as well as civil engineers are able to take part in the course as a result of the possibility of specializing during the course.

NEXT COURSE: October 1961.

The Philips International Institute of Technological Studies

Information: Director of Studies, Philips International Institute, Eindhoven.
Tel. 04900-60000, ext. 3835

COURSES OFFERED:

a. Individual, theoretical and experimental curricula on any subject within the range of Philips' activities; for instance, electronics and applications thereof, X-rays, light and lighting, etc.
b. Three-month course of lectures on basic electronics (October-December).
c. Three-month advanced-level course of lectures. The main subject of this course may differ from year to year but will generally be related to some form of applied electronics.

Teaching language is English. Nominal duration of a completed period of study is one year.

REQUIREMENTS FOR ADMISSION: a graduate science or engineering degree.

NEXT COURSES: In view of the individual character of the study, students may enter upon their course at any date; the courses mentioned will, however, usually start in October and February.

The Hague Academy of International Law

(Founded in 1923 with aid from the Carnegie Endowment).

Information: The Secretariat, The Hague Academy of International Law, Peace Palace, The Hague. Tel. 070-392344

COURSES OFFERED:

a. 32nd Summer Session, 1961 (consisting of two periods). Lectures on International Law in English and French are given in both periods. At the end of each period students admitted to the course sit for an examination, which leads, in the case of a pass, to the award of a diploma.

REQUIREMENTS FOR ADMISSION: Study and or practical experience in international law; university professors and students, civil servants, judges, lawyers, diplomatic, consular and international officers.

NEXT COURSE: 1st period: July 10–28, 1961; 2nd period July 31, August 18, 1961.

b. 5th Session of the Centre of Studies and Research in International Law and International Relations, August 22–September 30, 1961. During this session 30 specially selected participants will be dealing with case-studies in international law.
Attendants of the course will be divided into an English-speaking and a French-speaking group, each with its own Director of Studies.

REQUIREMENTS FOR ADMISSION: advanced academic degree, such as the Academy's diploma, or proof of at least three years actual practice in international affairs.

Ministry of Education, Arts and Sciences The Hague – State University at Utrecht

Information: Bureau Organization Congresses of the Ministry of Education, Arts and Sciences, 39, Mauritskade, The Hague.
Tel. 070-639927

COURSE OFFERED: Written and oral use of the Dutch language. Lectures on aspects of Dutch civilization.

REQUIREMENTS FOR ADMISSION: Every foreigner may register being at least 18 years old and having a sufficient knowledge of the Dutch language to follow the lectures.

NEXT COURSE: August 10–30, 1961.

New York University – Netherlands Universities Foundation for International Co-operation

Information: Dr. Seymour L. Flaxman, Director, New York University, Summer Session in Europe, University College of Arts and Science, New York University, University Heights, New York 53, N. Y.

COURSE OFFERED: Summer Session in Europe at the University of Leiden.
SUBJECTS: The Theory of Comparative Literature, The Modern European Drama, Trends of European Thought Since 1918, Seventeenth-Century European Art, The European Common Market, Its Politics and Economics.

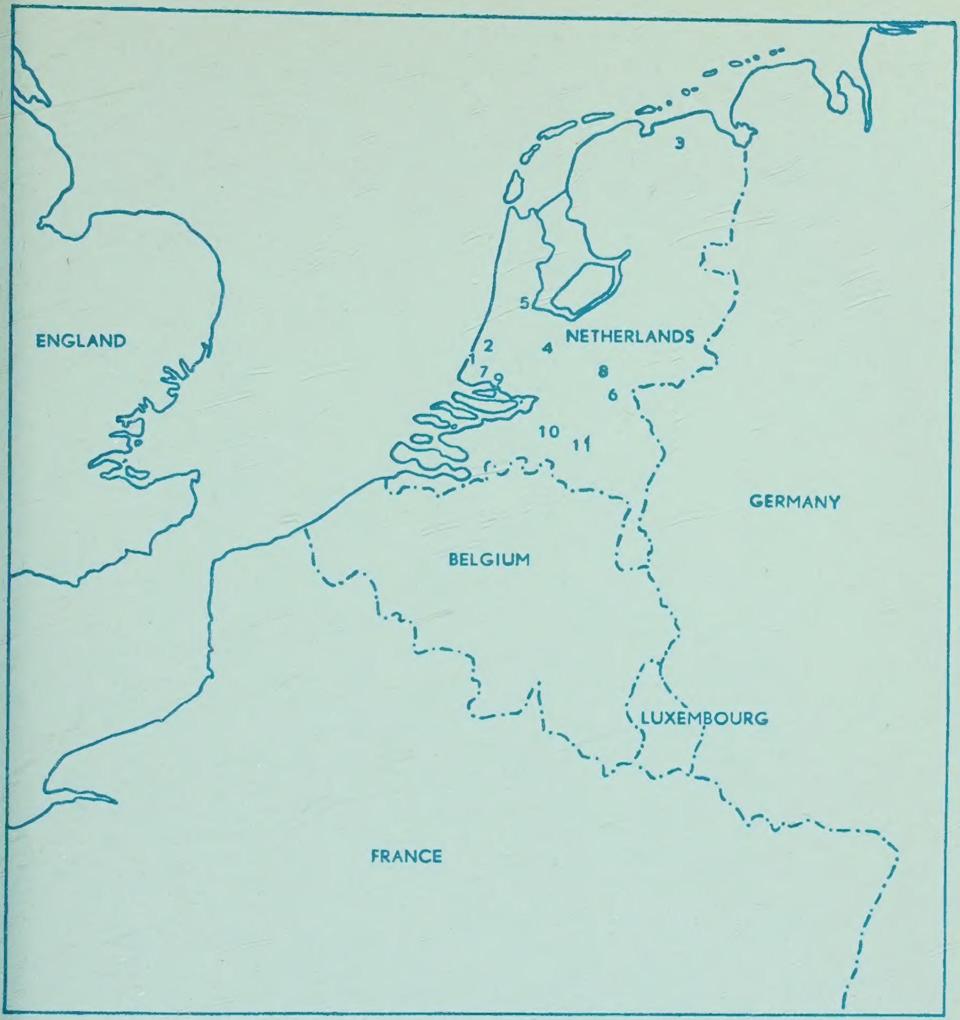
NEXT COURSE: July 10- August 18, 1961.

University of Pittsburgh – Netherlands Universities Foundation for International Co-operation

Information: Office of Cultural and Educational Exchange, University of Pittsburgh, Pittsburgh 13,Pa.

COURSE OFFERED: International seminar dealing with the educational status of Europe and the United States as they relate to the cultural patterns of the societies from which they have evolved.

NEXT COURSE: August 2–9, 1961.



1 = The Hague; 2 = Leyden; 3 = Groningen; 4 = Utrecht; 5 = Amsterdam; 6 = Nymegen; 7 = Delft; 8 = Wageningen; 9 = Rotterdam; 10 = Tilburg; 11 = Eindhoven.

The following institutions of higher education participate in the Netherlands Universities Foundation for International Co-operation:

State University at Leyden
State University at Groningen
State University at Utrecht
University of Amsterdam
Free (Reformed) University of Amsterdam
Roman Catholic University at Nymegen
Technological University at Delft
Agricultural University at Wageningen
Netherlands School of Economics at Rotterdam
Roman Catholic School of Economics at Tilburg
Technological University at Eindhoven

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